

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC.,  
Petitioner,

v.

CALIFORNIA INSTITUTE OF TECHNOLOGY,  
Patent Owner.

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Case IPR2017-00297<sup>1</sup>  
Patent 7,916,781 B2

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Before KEN B. BARRETT, TREVOR M. JEFFERSON, and  
JOHN A. HUDALLA, *Administrative Patent Judges*.

HUDALLA, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*Inter Partes* Review  
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

In Case IPR2017-00297 (“297 IPR”), Petitioner, Apple, Inc. (“Petitioner”), filed a Petition (Paper 5,<sup>2</sup> “297 Petition” or “297 Pet.”) requesting an *inter partes* review of claims 3–12 and 19–21 of U.S. Patent

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<sup>1</sup> Case IPR2017-00423 has been consolidated with this proceeding.

<sup>2</sup> Unless otherwise indicated, citations to papers and exhibits are made to Case IPR2017-00297.

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No. 7,916,781 B2 (Ex. 1001, “the ’781 patent”). Patent Owner, California Institute of Technology (“Patent Owner”), filed a Preliminary Response to the 297 Petition. Paper 14 (“297 Preliminary Response” or “297 Prelim. Resp.”). Taking into account the arguments presented in Patent Owner’s 297 Preliminary Response, we determined that the information presented in the 297 Petition established that there was a reasonable likelihood that Petitioner would prevail in challenging claims 19–21 of the ’781 patent under 35 U.S.C. § 102(b). Pursuant to 35 U.S.C. § 314, we instituted this proceeding on July 5, 2017, as to claims 19–21 of the ’781 patent. Paper 16 (“297 Institution Decision” or “297 Dec. on Inst.”).

In related Case IPR2017-00423 (“423 IPR”), Petitioner filed a second Petition (423 IPR, Paper 5, “423 Petition” or “423 Pet.”) requesting an *inter partes* review of claims 13–22 of the ’781 patent. Patent Owner filed a Preliminary Response to the 423 Petition. 423 IPR, Paper 14 (“423 Preliminary Response” or “423 Prelim. Resp.”). Taking into account the arguments presented in Patent Owner’s 423 Preliminary Response, we determined that the information presented in the 423 Petition established that there was a reasonable likelihood that Petitioner would prevail in challenging claims 13–16, 18, and 22 of the ’781 patent under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review proceeding on July 5, 2017, as to claims 13–16, 18, and 22 of the ’781 patent. Paper 18<sup>3</sup> (“423 Institution Decision” or “423 Dec. on Inst.”). In the 423 Institution Decision, we ordered the consolidation of the 423 IPR with the 297 IPR for purposes of trial. *Id.* at 25.

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<sup>3</sup> The 423 Institution Decision is included in the 297 IPR as Paper 18 because it includes a consolidation order.

During the course of trial, Patent Owner filed a Patent Owner Response (Paper 31, “PO Resp.”), and Petitioner filed a Reply to the Patent Owner Response (Paper 38, “Pet. Reply”). Patent Owner also filed a Sur-Reply (Paper 54, “PO Sur-Reply”), as was authorized by our Order of March 2, 2018 (Paper 47). An oral hearing was held on April 19, 2018, and a transcript of the hearing is included in the record. Paper 65 (“Tr.”).

Petitioner filed Declarations of James A. Davis, Ph.D., with the 297 Petition (Ex. 1004) and the 423 Petition (Ex. 1024). Petitioner also filed a Declaration of Brendan Frey, Ph.D. (Ex. 1049) with its Reply. Patent Owner filed a Declaration of Michael Mitzenmacher, Ph.D., with its Response (Ex. 2004). The parties also filed transcripts of the depositions of Dr. Davis (Ex. 2033) and Dr. Mitzenmacher (Ex. 1045).

As authorized in our Order of February 10, 2018 (Paper 39), Patent Owner filed a motion for sanctions related to Petitioner’s cross-examination of Patent Owner’s witness, Dr. Mitzenmacher<sup>4</sup> (Paper 40), and Petitioner filed an opposition (Paper 44).

Patent Owner also filed a motion to exclude certain exhibits filed by Petitioner. Paper 49. Petitioner filed an opposition (Paper 53), and Patent Owner filed a reply (Paper 55).

In light of the U.S. Supreme Court’s decision in *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018), we modified the 297 Institution Decision and

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<sup>4</sup> Petitioner’s motion also seeks sanctions related to Petitioner’s cross-examination of Dariush Divsalar, Ph.D., in certain related cases. See Paper 40, 3–7. Nevertheless, Patent Owner did not file direct testimony from Dr. Divsalar in this consolidated case. Accordingly, we only address Patent Owner’s motion for sanctions in this case to the extent it relates to Dr. Mitzenmacher’s cross-examination.

the 423 Institution Decision to institute on all of the challenged claims and all of the grounds presented in the 297 Petition and the 423 Petition.

Paper 61. Subsequently, the parties filed a joint motion to limit the Petitions to the claims and grounds that were originally instituted. Paper 63. We granted the motion. Paper 64. As a result, the remaining instituted grounds are the same as they had been at the time of the 297 Institution Decision and the 423 Institution Decision. *See id.* at 3.

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 13–16 and 18–22 of the '781 patent. For the reasons discussed below, Petitioner has demonstrated by a preponderance of the evidence that claims 19–21 are unpatentable. Petitioner has not demonstrated by a preponderance of the evidence that claims 13–16, 18, and 22 are unpatentable.

## I. BACKGROUND

### A. *Related Proceedings*

The parties identify the following district court cases related to the '781 patent (297 Pet. 1; 423 Pet. 1; Paper 7, 1):

*Cal. Inst. of Tech. v. Broadcom Ltd.*, No. 2:16-cv-03714 (C.D. Cal. filed May 26, 2016);<sup>5</sup>

*Cal. Inst. of Tech. v. Hughes Commc'ns, Inc.*, No. 2:15-cv-01108 (C.D. Cal. filed Feb. 17, 2015); and

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<sup>5</sup> Petitioner is a defendant in this case. *See* 297 Pet. 1; 423 Pet. 1.

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*Cal. Inst. of Tech. v. Hughes Commc'ns, Inc.*, 2:13-cv-07245 (C.D. Cal. filed Oct. 1, 2013).

The '781 patent was previously subject to an *inter partes* review in Case IPR2015-00059 ("059 IPR"). 297 Pet. 1, 19; 423 Pet. 1, 19; Ex. 1011; Paper 7, 1. In the Final Written Decision from the 059 IPR, which Petitioner filed as Exhibit 1011 in this proceeding, the Board determined that claims 1 and 2 of the '781 patent are unpatentable as anticipated by a reference known as "Divsalar" that is no longer at issue in this consolidated proceeding. *See* Ex. 1011, 43.

Petitioner additionally states that patents in the priority chain of the '781 patent were challenged in Cases IPR2015-00068, IPR2015-00067, IPR2015-00060, IPR2015-00061, and IPR2015-00081. 297 Pet. 1; 423 Pet. 1. We additionally identify the following cases between the parties: Cases IPR2017-00210, IPR2017-00211, IPR2017-00219, IPR2017-00700, IPR2017-00701, IPR2017-00702, IPR2017-00703, and IPR2017-00728.

*B. The '781 patent*

The '781 patent describes the serial concatenation of interleaved convolutional codes forming turbo-like codes. Ex. 1001, Title. It explains some of the prior art with reference to its Figure 1, reproduced below.

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